In the Claims:

Please amend the claims as follows:

1. (withdrawn) A photodiode array, comprising:

a plurality of arrayed individual diode devices, including:

at least one active photodiode; and

at least one reference diode.

2. (withdrawn) The photodiode array of claim 1 wherein the diode devices are fabricated on a single semiconductor substrate.

3. (withdrawn) The photodiode array of claim 2 wherein the photodiode array includes a substrate and each of the diode devices includes:

a first layer of substantially intrinsic semiconductor material of a first conductivity type;

a second layer of a doped semiconductor material of the first conductivity type located at one of in and over the first layer;

a third layer of semiconductor material of a second conductivity type located at one of in and over the second layer.

4. (withdrawn) The photodiode array of claim 3 wherein each diode device further includes:

a region of a doped semiconductor material of the second conductivity type that is one of:

sandwiched as a layer between the substrate and the first layer; and

in contact with the first layer; and

the region having a higher carrier concentration than the first layer.

5. (withdrawn) The photodiode array of claim 2 further comprising a biasing circuit that:

applies a first bias voltage to each of the at least one reference diode;

applies a second bias voltage to each of the at least one active photodiode, the second bias voltage having a predetermined relationship with the first bias voltage;

monitors operation of the at least one reference diode at the applied first bias voltage; and

adjusts the applied first bias voltage to drive the monitored operation of the at least one reference diode to an optimal condition.

6. (withdrawn) The photodiode array of claim 5 wherein the predetermined relationship between the first and second bias voltages is equality.

7. (withdrawn) The photodiode array of claim 5 wherein the biasing circuit comprises:

a bias voltage generator having outputs connected to apply the first bias voltage to the at least one reference diode and the second bias voltage to the at least one active photodiode;

a detector having an input connected to the at least one reference diode to measure an operational characteristic thereof in response to the first bias voltage; and

a comparator that compares the measured certain operational characteristic to a reference value and controls the bias voltage generator to adjust the first and second bias voltages in a manner that drives the measured certain operational characteristic to substantially match the reference value.

8. (withdrawn) The photodiode array as in claim 7 wherein the operational characteristic comprises a reference diode responsivity at the applied first bias voltage.

9. (withdrawn) The photodiode array as in claim 8 wherein the reference diode responsivity is measured for a known intensity of light incident on the at least one reference diode.

10. (withdrawn) The photodiode array as in claim 9 wherein the reference diode responsivity is measured in the absence of incident light on the at least one reference diode.

11. (withdrawn) The photodiode array as in claim 6 wherein:

the at least one reference diode provides an output current; and

the detector measures the output current of the at least one reference photodiode at the applied first bias voltage.

12. (withdrawn) The photodiode array as in claim 11 wherein the detector measures the output current at one of (a) a known intensity and (b) zero intensity of light incident on the at least one reference diode.

13. (withdrawn) The photodiode array as in claim 11 wherein the reference diode includes:

a high field region; and

means for injecting charge carriers to be swept into the high field region to generate the reference diode output current.

14. (withdrawn) The photodiode array as in claim 13 wherein:

the biasing circuit comprises a current generator for applying a predetermined input current to the means for injecting charge carriers;

the detector operates to determine a relationship between the reference diode output current and the input current and thereby obtain a value indicative of responsivity of the at least one reference diode;

the reference value comprises a reference responsivity; and

the comparator operates to compare the value indicative of responsivity to the reference responsivity.

15. (withdrawn) The photodiode array as in claim 11 wherein the detector determines a derivative of the logarithm of the output current, and wherein the comparator compares the obtained derivative of the logarithm of the output current to a reference.

16. (withdrawn) The photodiode array of claim 5 wherein the biasing circuit is additionally fabricated in the single semiconductor substrate.

17. (original) A biasing circuit for an avalanche photodiode having at least one associated reference diode, the biasing circuit comprising:

a bias voltage generator having a first output for applying a first bias voltage to the at least one reference diode and a second output for applying a second bias voltage to the avalanche photodiode, the second bias voltage having a predetermined relationship with the first bias voltage;

a detector having an input connected to the at least one reference diode to measure an operational characteristic thereof in response to the first bias voltage; and

a comparator that compares the measured operational characteristic to a reference value and that controls the bias voltage generator to adjust the first bias voltage and the second bias voltage in a manner that drives the measured operational characteristic to substantially match the reference value.

18. (original) The biasing circuit as in claim 17 wherein the predetermined relationship between the first bias voltage and the second bias voltage is equality.

19. (original) The biasing circuit as in claim 17 wherein the operational characteristic comprises a reference diode responsivity at the applied first bias voltage.

20. (original) The biasing circuit as in claim 19 wherein the reference diode responsivity is measured for a known intensity of light incident on the at least one reference diode.

21. (original) The biasing circuit as in claim 20 wherein the reference diode responsivity is measured in the absence of incident light on the at least one reference diode.

22. (original) The biasing circuit as in claim 17 wherein:

the at least one reference diode provides an output current; and

the detector measures the output current of the at least one reference photodiode at the applied first bias voltage.

23. (original) The biasing circuit as in claim 22 wherein the detector measures the output current at one of (a) a known intensity and (b) zero intensity of light incident on the at least one reference diode.

24. (original) The biasing circuit as in claim 22 wherein the reference diode includes:

a high field region; and

means for injecting charge carriers to be swept into the high field region to generate the reference diode output current.

25. (original) The biasing circuit as in claim 24 further including:

a current generator for applying a predetermined input current to the means for injecting charge carriers;

and wherein:

the detector operates to determine a relationship between the reference diode output current and the input current and thereby obtain a value indicative of responsivity of the at least one reference diode;

the reference value comprises a reference responsivity; and

the comparator operates to compare the value indicative of responsivity to the reference responsivity.

26. (original) The biasing circuit as in claim 22 wherein the detector determines a derivative of the logarithm of the output current, and wherein the comparator compares the obtained derivative of the logarithm of the output current to a reference.

27. (original) The biasing circuit of claim 17 wherein the biasing circuit, reference diode and avalanche photodiode are fabricated in the same semiconductor substrate.

28. (withdrawn) An avalanche photodiode, comprising:

a high field area associated with a pn junction; and

means for injecting charge carriers to be swept into the high field region to generate diode output current.

29. (withdrawn) The avalanche photodiode as in claim 28:

wherein the pn junction is formed from a first conductivity type layer and a second conductivity type layer formed at one of in and over the first conductivity type layer; and

wherein the means for injecting comprises a heavily doped second conductivity type region physically separate from the layers forming the pn junction and comprising a source of the charge carriers that are swept into the high field area.

30. (withdrawn) The avalanche photodiode as in claim 29 further including an electrode connected to the heavily doped second conductivity type region, the electrode receiving an input current in response to which the charge carriers are injected into the high field area.

31. (withdrawn) The avalanche photodiode as in claim 29 further including a substantially intrinsic layer of the first conductivity type physically separating the heavily doped second conductivity type region from the first conductivity type layer of the pn junction.

32. (withdrawn) The avalanche photodiode as in claim 31 further including an additional first conductivity type region separating the heavily doped second conductivity type region from the substantially intrinsic layer.

33. (withdrawn) The avalanche photodiode as in claim 31 further including a substrate layer underlying the heavily doped second conductivity region.

34. (original) The avalanche photodiode as in claim 33 further including a pair of electrodes, one electrode of the pair connecting to a layer of the pn junction and another electrode of the pair connecting to the substrate layer, wherein a reverse bias voltage is applied between the pair of electrodes to generate the high field area.

35. (original) A method for biasing an avalanche photodiode having an associated reference diode, comprising the steps of:

generating a first bias voltage for application to the reference diode;

generating a second bias voltage for application to the avalanche photodiode, the second bias voltage having a predetermined relationship with the first bias voltage;

measuring an operational characteristic of the reference diode in response to application of the first bias voltage;

comparing the measured operational characteristic to a reference value; and

adjusting the first bias voltage and second bias voltage in a manner that drives the measured operational characteristic to substantially match the reference value.

36. (currently amended) The method as in claim [[34]] 35 wherein the predetermined relationship between the first and second bias voltages is equality.

37. (original) The method as in claim 35 wherein the operational characteristic comprises a reference diode responsivity at the applied first bias voltage.

38. (original) The method as in claim 35 further including the step of applying a known intensity of light incident on the reference diode, and wherein the step of measuring the reference diode responsivity is measured for that known intensity of light.

39. (original) The method as in claim 37 wherein the reference diode responsivity is measured in the absence of incident light on the at least one reference photodiode.

40. (original) The method as in claim 35 further including the step of generating an output current from the reference diode and wherein the step of measuring comprises the step measuring the output current at the applied first bias voltage.

41. (original) The method as in claim 40 wherein the output current is measured at one of (a) a known intensity and (b) zero intensity of light incident on the reference diode.

42. (original) The method as in claim 40 further comprising the steps of:

applying a predetermined input current to the matched reference diode;

injecting charge carriers proportional to the predetermined input current to be swept into a high field region of the reference diode to generate the diode output current; and

determining a relationship between the output current and the input current to obtain a value indicative of the responsivity of the reference diode;

wherein the reference value comprises a reference responsivity, and

wherein the step of comparing compares the obtained value indicative of the responsivity to the reference responsivity.

43. (original) The method as in claim 40 further including the step of:

determining a derivative of the logarithm of the output current, and wherein the step of comparing compares the obtained derivative of the logarithm of the output current to a reference.